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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003901224 for a patent by IP.ONE PTY LTD as filed on 17 March 2003.



WITNESS my hand this  
Thirtieth day of March 2004

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**PROVISIONAL SPECIFICATION**

**Applicant(s) :**

IP.ONE PTY LTD  
A.C.N. 088 075 852

**Invention Title:**

A VALVE



The invention is described in the following statement:

A VALVE

Field of the Invention

The present invention broadly relates to a valve and particularly, though not exclusively, to a valve for an inflatable bladder or a vessel and to a sports-ball or a vessel having the valve.

Background of the Invention

Valves of the "duckbill" type are widely used for sports-balls. Figure 1 shows a cross-sectional representation of such a valve. The valve 10 is surrounded by a casing 12 that is connected to an inflatable bladder 14. The valve comprises an aperture (indicated by dashed line 16) that is biased towards a closed condition. The valve also comprises an injector recess 18 for receiving injector 20.

The aperture of such a valve for a sports-ball needs to be relatively strong to ensure that asymmetrical external mechanical impact, for example when the ball is kicked during a soccer match, does not result in sudden opening of the aperture and loss of air pressure. Due to the strength of the aperture, filling of the sports-ball with air requires forcing the injector 20 through the entire aperture 22 which is shown in Figure 2.

However, injectors often do not have a perfectly smooth surface and may have damaged surface areas, sharp edges or small metallic projections that result from the manufacturing process. These inhomogenities may damage the aperture when the injector is inserted into the valve or pulled out which may cause leakage of the valve.

Summary of the Invention

The present invention provides in a first aspect a valve comprising:

- 5       an outer surface,
- a passageway for a fluid extending from an opening of the surface through the valve,
- a first valve portion being at least in part formed from a resilient material positioned around an aperture
- 10   portion of the passageway and biasing the aperture portion towards a closed condition and being moveable to an open condition, and
- a second valve portion extending from the outer surface and the first valve portion, the second valve
- 15   portion having a stabilisation zone that reduces likelihood of moving the aperture portion to the open condition under external impact.

In a first preferred embodiment of the invention,

20   the second valve portion is connected to, or is arranged for connection to, an inflatable bladder such as the inflatable bladder of a sports-ball. As the stabilisation reduces likelihood of moving the aperture portion to the open condition, the aperture can be weaker compared with

25   prior art valves. In this case air may be filled into the bladder without the need of forcing an injector through the aperture. Consequently, the risk of damaging the aperture by the injector is reduced. Further, even if a user prefers to use an injector and forces the injector

30   through the aperture, the risk of damage is still reduced again owing to the weaker aperture. In addition, the above-defined valve may be lighter than prior art valves

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which is of particular advantage for sports-ball applications.

The present invention provides in a second aspect a valve comprising:

5 an outer surface,

a passageway for a fluid extending from an opening of the surface through the valve,

10 a first valve portion being at least in part formed from a resilient material positioned around an aperture portion of the passageway and biasing the aperture portion towards a closed condition and being moveable to an open condition, and

15 a second valve portion disposed between the outer surface and the first valve portion, the second valve portion having a stabilisation zone that is more flexible than the first valve portion.

The present invention provides in a third aspect a sports-ball having an inflatable bladder having a valve comprising:

20 a passageway for a fluid extending from an opening of the inflatable bladder through the valve,

25 a first valve portion being at least in part formed from a resilient material positioned around an aperture portion of the passageway and biasing the aperture portion towards a closed condition and being moveable to an open condition, and

30 a second valve portion disposed between the inflatable and the first valve portion, the second valve portion having a stabilisation zone that reduces likelihood of moving the aperture portion to the open condition under external mechanical impact.

The stabilisation zone preferably comprises a peripheral recess at which the cross-sectional area of the

valve is reduced. In this case the first valve portion of the valve may extend from the second valve portion with an end portion of decreasing cross-sectional area.

5 The cross-sectional area of the valve at the stabilisation zone preferably is approximately 30 to 80% of the maximum cross-sectional area of the first portion.

The stabilisation zone may be one of two or more stabilisation zones.

10 The valve preferably is integrally formed in one piece. The valve preferably comprises a flexible polymeric material and most preferably is composed of a rubber-like material.

The passageway may be arranged for receiving an injector for a fluid.

15 The present invention also provides a sports-ball having the above-described valve.

It will be appreciated that the valve according to the first aspect of the invention also has other applications. The second valve portion may also be  
20 connected to, or arranged for connection to, a first surface and a second surface respectively. Optionally the second valve portion may comprise at least one additional stabilisation zone. In this case the or each additional stabilisation zone preferably is positioned between the  
25 first and the second surface. The first and/or the second surface may be a part of a first and second vessel respectively and the second valve portion may therefore provide a flexible conduit from the first surface or vessel to the second surface or vessel.

30 In a third preferred embodiment of the present invention the second portion of the valve also comprises a flexible sleeve. The flexible portion preferably

surrounds at least in part the stabilisation zone and the first portion of the valve.

The present invention provides in a fourth aspect a vessel having a valve, the valve comprising:

5 a passageway for a fluid extending from an opening of the vessel through the valve,

a first valve portion being at least in part formed from a resilient material positioned around an aperture portion of the passageway and biasing the aperture portion  
10 towards a closed condition and being moveable to an open condition, and

a second valve portion disposed between the vessel and the first valve portion, the second valve portion having a stabilisation zone that reduces likelihood of  
15 moving the aperture portion to the open condition under external impact.

#### Brief Description of the Drawings

Figure 1 shows a cross-sectional representation of a  
20 sports-ball valve (prior art),

Figure 2 shows a cross-sectional representation of the sports-ball valve illustrated in Figure 1 with an injector (prior art),

Figure 3 shows (a) a side, (b) a cross-sectional  
25 representation and (c) a bottom-view of a valve according to an embodiment of the invention,

Figure 4 shows a cross-sectional representation of the valve according to another embodiment of the present invention,

30 Figure 5 shows (a) a side view, (b) a cross-sectional representation and (c) a bottom-view of the valve according to a further embodiment of the present invention and

Figure 6 shows (a) a side view, (b) a cross-sectional representation of the valve according to a yet further embodiment of the present invention.

5 Detailed Description of a Preferred Embodiments

Referring to Figure 3, the valve is now described. Figure 3 (a) shows the valve 30 which is in this embodiment of a round cross-sectional shape. The valve 30 has a stabilisation zone of reduced cross-sectional area which, in this embodiment, has the form of a circular  
10 recess 32. The recess 32 is included in a second portion 31 of the valve 30. The valve 30 also comprises a first portion 34 that extends with decreasing cross-sectional area towards an end-face 36. The second portion 38 has a  
15 surface 40 that is arranged for connection to the interior of a bladder (not shown). The valve 30 is composed of a rubber-like material.

Figure 3 (b) shows a cross-sectional representation of the valve 30 having a passageway portion 42 for  
20 receiving an injector. A passageway portion 44 extends inwardly from the passageway portion 42 and towards an aperture portion (not shown in Figure 3(b)). The portion 44 has a conical shape and the aperture portion extends from the tip of the conical portion 44 to the end-face 36.

25 Figure 3(c) shows a bottom view of the valve 30. The Figure shows the aperture portion 46 which in this example is in form of a slit. In this embodiment the valve is composed from a rubber-like material which biases the aperture portion 46 towards a closed condition.

30 The circular recess 32 has a cross-sectional area that is approximately 50% of that of the maximum cross-sectional area of the first portion 34. In use, this reduction in cross-sectional area at the recess 34 reduces



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the sensitivity of the aperture portion 46 to external impact.

Figure 4 shows a valve according to another embodiment of the present invention. In this embodiment the valve 50 has two stabilisation zones provided in form of two recesses 32. The sensitivity to external asymmetrical impact therefore is further reduced.

Referring now to Figure 5, a valve according to another embodiment of the present invention is now described. The Figure shows the valve 60 comprising a first portion 34 and a second portion 62. The second portion 62 comprises additional stabilisation zones 64 and is connected to a second surface 66 that is part of first vessel. The second portion 62 is also connected to a first surface 68 that is part of a second vessel and the additional stabilisation zones 64 are positioned between the surfaces 66 and 68.

Referring to Figure 6, a valve according to a further embodiment of the present invention is now described. The Figure shows the valve 70 comprising a first portion 34 and a second portion 31. The second portion 31 is connected to a first surface 72 and the first surface 72 is connected to a flexible tube 74. In this embodiment the flexible tube 74 is connected to a second surface 76. For example, the first and second surfaces may be a part of an outer and inner vessel, respectively. For example, the inner vessel may be a water or fuel tank and the first and second valve portions may provide for a remote access the outer vessel or housing of the water or fuel tank.

Although the invention has been described with reference to particular examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

The Claims defining the Invention are as follows:

1. A valve comprising:

an outer surface,

5 a passageway for a fluid extending from an opening of the surface through the valve,

a first valve portion being at least in part formed from a resilient material positioned around an aperture portion of the passageway and biasing the aperture portion towards a closed condition and being moveable to an open condition, and

10 a second valve portion extending from the outer surface and the first valve portion, the second valve portion having a stabilisation zone that reduces likelihood of moving the aperture portion to the open condition under external impact.

2. A valve comprising:

an outer surface,

20 a passageway for a fluid extending from an opening of the surface through the valve,

a first valve portion being at least in part formed from a resilient material positioned around an aperture portion of the passageway and biasing the aperture portion towards a closed condition and being moveable to an open condition, and

25 a second valve portion disposed between the outer surface and the first valve portion, the second valve portion having a stabilisation zone that is more flexible than the first valve portion.

3. The valve as claimed in claim 1 or 2 wherein the stabilisation zone comprises a peripheral recess at which the cross-sectional area of the valve is reduced.
- 5 4. The valve as claimed in any one of the preceding claims wherein the first portion extends from the second portion with an end portion of decreasing cross-sectional area.
- 10 5. The valve as claimed in any one of the preceding claims wherein the cross-sectional area of the valve at the stabilisation zone is approximately 30 to 80% of the maximum cross-sectional area of the first portion.
- 15 6. The valve as claimed in any one of the preceding claims wherein the stabilisation zone is one of two or more stabilisation zones.
- 20 7. The valve as claimed in any one of the preceding claims integrally formed in one piece.
8. The valve as claimed in any one of the preceding claims comprising a flexible polymeric material.
- 25 9. The valve as claimed in any one of the preceding claims composed of a rubber-like material.
- 30 10. The valve as claimed in any one of the preceding claims wherein the passageway is arranged for receiving an injector.

11. The valve as claimed in any one of the preceding claims wherein the second portion is connected to, or is arranged for connection to, an inflatable bladder.

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12. The valve as claimed in claim 11 wherein the second portion is connected to, or is arranged for connection to, a first surface.

10 13. The valve as claimed in claim 12 wherein the second portion is connected to, or is arranged for connection to, a second surface.

14. The valve as claimed in claim 13 wherein the second  
15 valve portion comprises at least one additional stabilisation zones.

15. The valve as claimed in claim 14 wherein the or each  
20 additional stabilisation zone is positioned between the first and the second surface.

16. The valve as claimed in claim 12 to 15 wherein the first surface is a part of a first vessel.

25 17. The valve as claimed in claim 13 or any one of claims 14 to 16 when dependent on claim 13 wherein the second surface is a part of a second vessel.

18. The valve as claims in claim 1 to 15 wherein the  
30 second portion is connected to a flexible sleeve that surrounds at least in part the stabilisation zone of the first portion.

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19. A vessel having a valve, the valve comprising:

a passageway for a fluid extending from an opening of the vessel through the valve,

5 a first valve portion being at least in part formed from a resilient material positioned around an aperture portion of the passageway and biasing the aperture portion towards a closed condition and being moveable to an open condition, and

10 a second valve portion disposed between the vessel and the first valve portion, the second valve portion having a stabilisation zone that reduces likelihood of moving the aperture portion to the open condition under external impact.

15 20. A sports-ball having a valve as claimed in any one of claims 1 to 10.

21. A sports-ball having an inflatable bladder having a valve comprising:

20 a passageway for a fluid extending from an opening of the inflatable bladder through the valve,

25 a first valve portion being at least in part formed from a resilient material positioned around an aperture portion of the passageway and biasing the aperture portion towards a closed condition and being moveable to an open condition, and

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a second valve portion disposed between the  
inflatable bladder and the first valve portion, the second  
valve portion having a stabilisation zone that reduces  
likelihood of moving the aperture portion to the open  
5 condition under external impact.

DATED this 17<sup>th</sup> day of MARCH 2003

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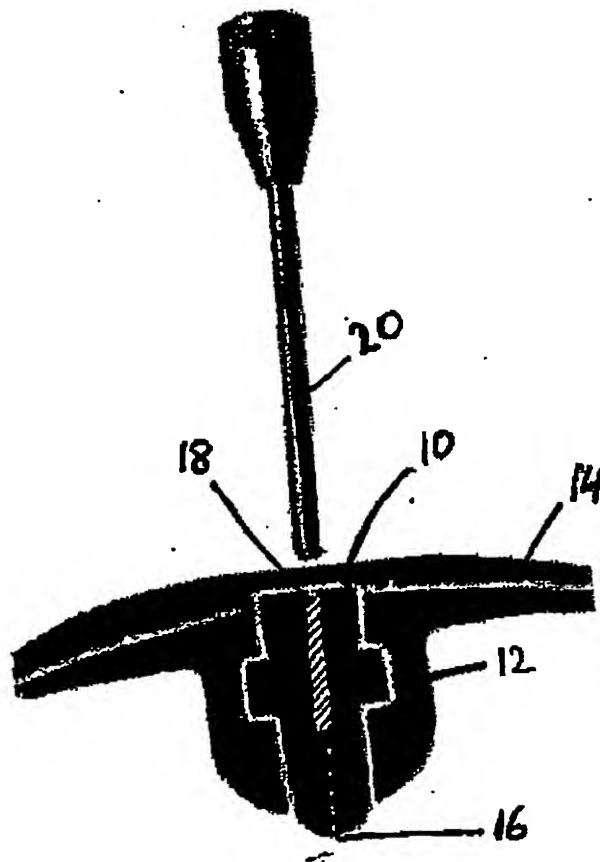
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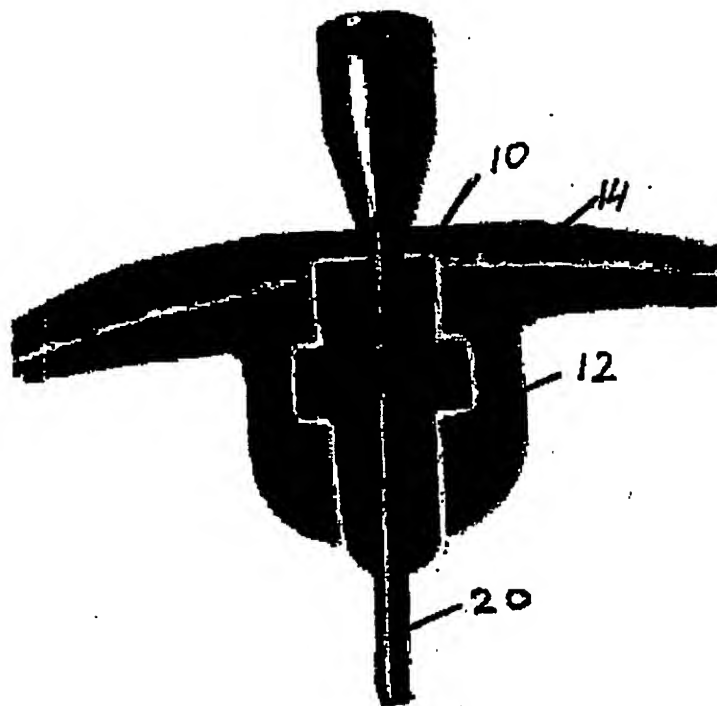
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Prior Art

FIG. 1



Prior Art

FIG. 2



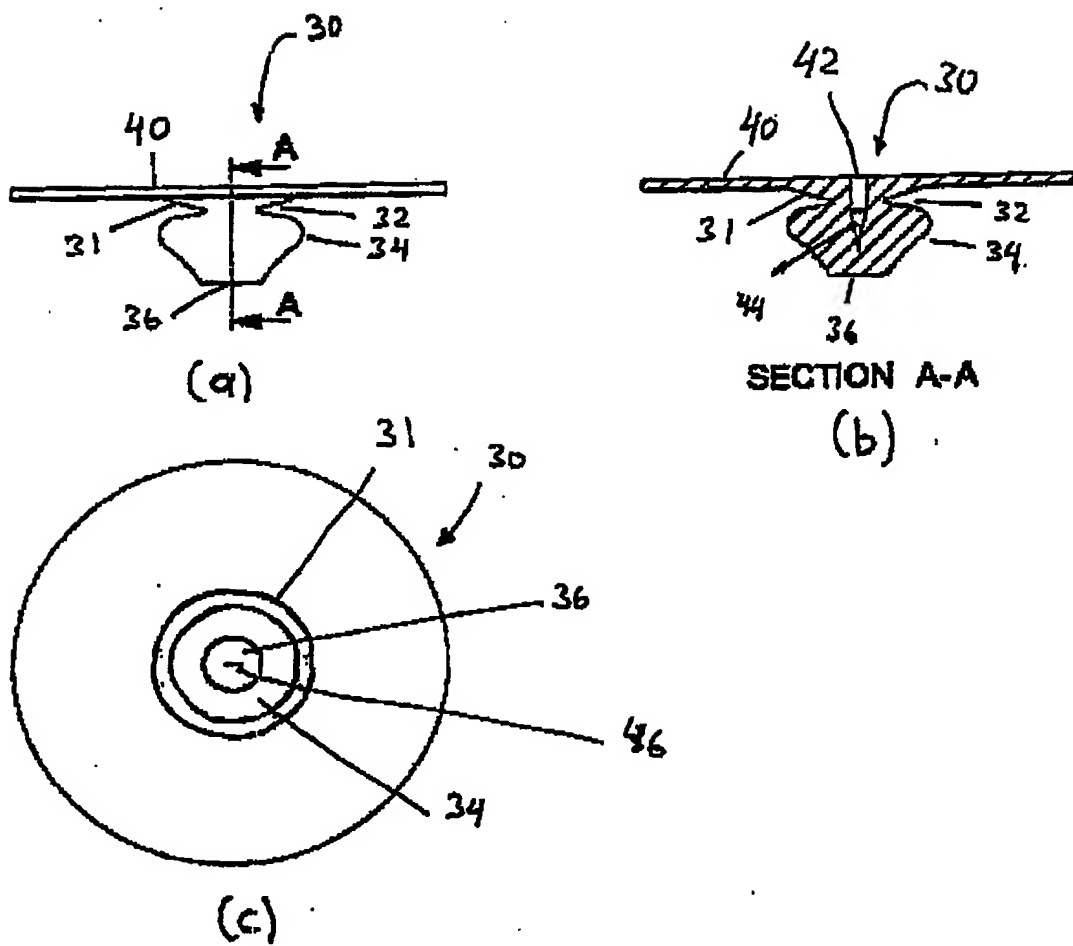


FIG. 3

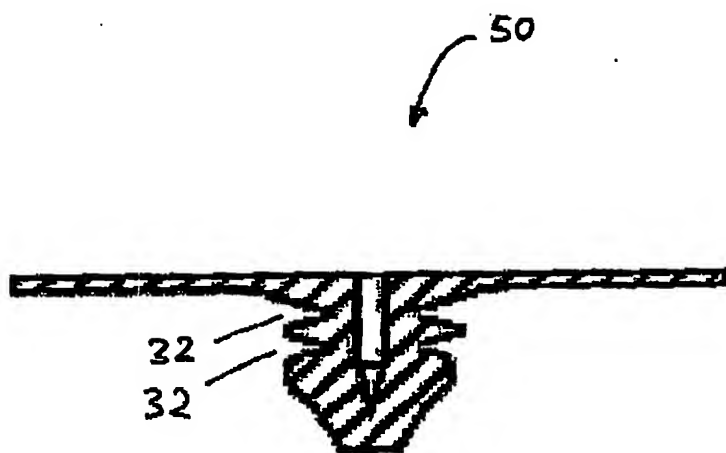
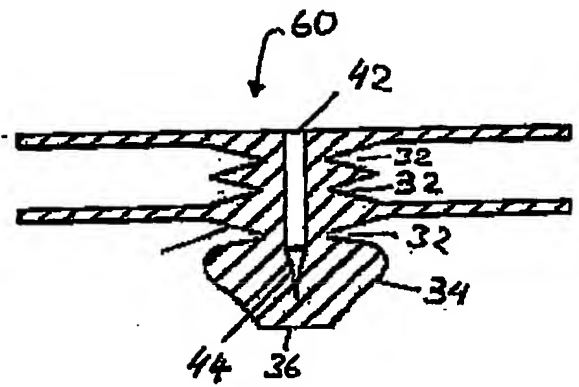
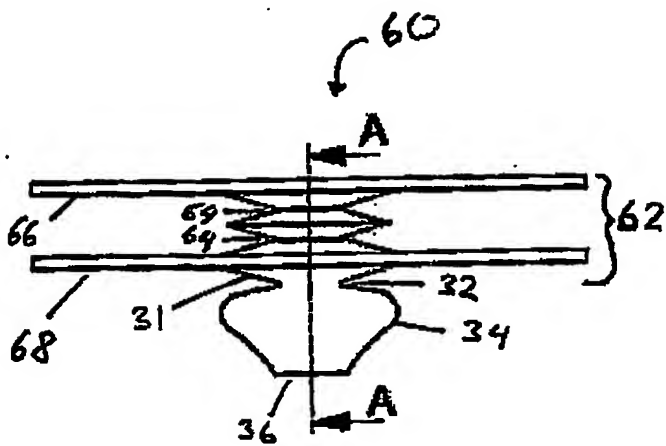
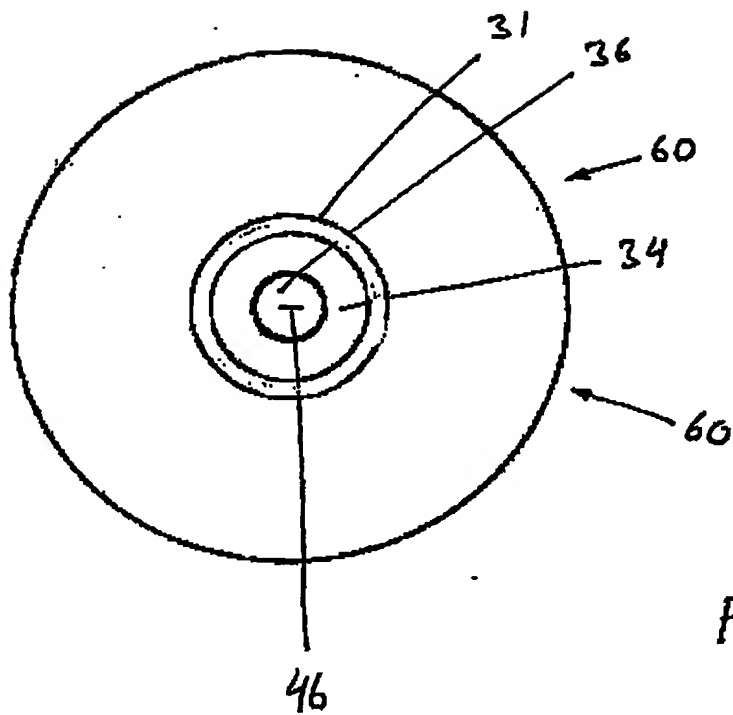


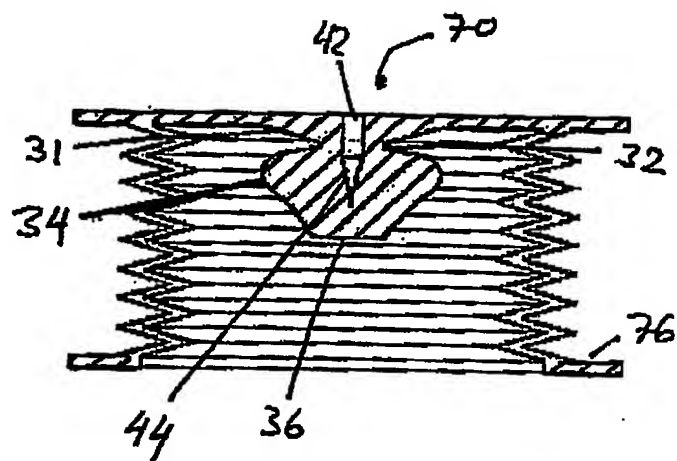
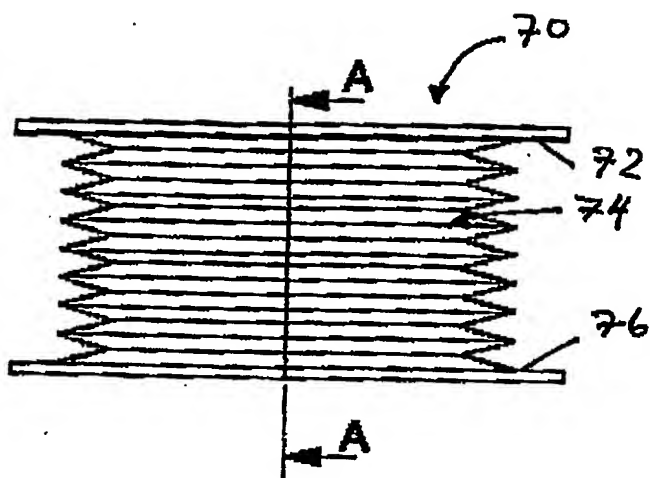
FIG. 4



**SECTION A-A**



**FIG. 5**



SECTION A-A

FIG. 6